

Ecological Site Description—Rangeland

Overflow (Ov) 11–14" MAP

MLRA: 58AC – Sedimentary Plains, Central
R058AC045MT



1. Physiographic features: This ecological site occurs in swales and narrow drainages where it receives more than normal moisture because of run-in from adjacent areas. It is associated mainly with ephemeral streams (those that flow only in direct response to a precipitation event or snow melt, and the water table is lower than the channel bottom).

Landform: swale, drainageway

Elevation (feet): 2,250–4,500

Slope (percent): 0–4

Depth to Water Table (inches): greater than 60

Flooding: none to rare

Ponding: none

Aspect: not significant

Influencing water features:

STREAM TYPE:

Ephemeral, flowing only in direct response to snow melt or precipitation events. Ephemeral streams typically flow less than 30 consecutive days at a time. The bottom of the channel is above the water table at all times. The Rosgen system of classification does not apply to ephemeral systems.

Non-Stream Characteristics: N/A

2. Soils: The soils associated with this ecological site are moderately deep to very deep. Textures will vary since these soils are alluvial, having been deposited by stream flow events. Surfaces are often dark due to the supplemental moisture this site receives. Available water holding capacity is generally greater than 6 inches. Permeability is variable due to the various textures and patterns of deposition that occur.

3. Associated sites: Subirrigated, Wet Meadow, Silty, Clayey, Sandy, Sandy-Steep, Silty-Steep, and Clayey-Steep.

4. Similar sites: Wet Meadow, Saline Overflow, Riparian Subirrigated, Stream Terrace.

The Wet Meadow site differs mainly by being wet to at or near the surface for most of the growing season.

The Saline Overflow site differs mainly by being salt affected.

The Riparian Subirrigated site differs mainly by being adjacent to perennial or intermittent streams and being frequently flooded.

The Stream Terrace site is also typically adjacent to perennial or intermittent streams and may have a permanent water table, but it usually is at a deeper depth than the Riparian Subirrigated.

5. Major Plant Community Types: The following are descriptions of several plant communities that may occupy this site:

Plant Community 1: Tall and Medium Grasses/ Forbs/ Shrubs: The physical aspect of this site in the Historical Climax (HCPC) is that of a swale grassland dominated by cool season grasses, with forbs and shrubs occurring in smaller percentages. Relative composition by weight of annual production on this ecological site is approximately 75–80% grasses and sedges, 5% forbs, and 5–10% woody species. The canopy cover of shrubs is 1 to 10%.

This plant community contains a diversity of tall and medium height, cool season grasses (**basin wildrye, green needlegrass, and bluebunch, slender, and bearded wheatgrass**). Warm season grasses (**prairie cordgrass**) may also occasionally be present. There are numerous forbs that occur in smaller percentages. Shrubs such as **western or common snowberry, Wood's rose** and occasionally **chokecherry, golden currant, or American plum** can be common.

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This plant community is well adapted to the Northern Great Plains climatic conditions. The diversity in plant species and presence of tall, deep rooted perennial grasses allows for drought tolerance. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and runoff events, and temperature). Plants on this site have strong, healthy root systems that allow production to increase significantly with favorable moisture conditions. Abundant plant litter is available for soil building and moisture retention.

The location of this site in the landscape plus the influence of extra water in the early part of the growing season provides a very favorable soil-water-plant relationship. This plant community provides for soil stability and a functioning hydrologic cycle. Plant litter is available for soil building and moisture retention. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. Maintaining good plant cover is necessary for successful management and production and to avoid excessive erosion during runoff events.

Plant Community 2: Medium and Short Grasses/ Invasive Forbs/ Shrubs: Slight degradation in the Historic Climax Plant Community, including a beginning response to non-prescribed grazing, will tend to change the HCPC/PPC to a community represented by an increase in **western wheatgrass and western snowberry** and other grasses such as **needleandthread, Sandberg bluegrass, prairie junegrass, and plains reedgrass**. The medium and tall grasses such as **basin wildrye, green needlegrass, bluebunch, bearded and slender wheatgrass** will still be present, sometimes in relatively large amounts. There may be an increase in some non-palatable forbs such as **cudweed sagewort and western yarrow**.

Biomass production and litter become reduced on the site as the taller grasses disappear, increasing evaporation and reducing moisture intake and retention. Additional open space in this community can result in undesirable invader species such as **leafy spurge and Canada thistle** moving in. This plant community provides for moderate soil stability.

Plant Community 3: Shrubs/ Medium and Short Grasses/ Invasive Forbs: With continued heavy disturbance, the site will become dominated by **western or common snowberry**. **Western wheatgrass, needleandthread, Sandberg bluegrass, and plains reedgrass** become more prevalent. The taller grasses (basin wildrye, green needlegrass, bluebunch, bearded, and slender wheatgrass) will still be present, but in much smaller amounts. Palatable forbs will be mostly absent, having been replaced by species such as **cudweed sagewort and western yarrow**. Weedy species such as **dandelion and thistle** often become more abundant.

Plant Community 4: Shrubs/ Non-native Short Grasses/ Invasive Forbs: If heavy disturbance continues, plant community 3 can deteriorate to one primarily composed of shrubs (**snowberry, rose**) and non-native short grasses (**Kentucky/Canada bluegrass**). Western wheatgrass may be present. The taller grasses will occur only rarely, often underneath the shrub canopy. Invasive forbs (e.g., **thistles, leafy spurge**) are likely to invade.

Plant Communities 3 and 4 are significantly less productive than Plant Communities 1 or 2. The lack of litter and short plant heights result in higher soil temperatures, poor water infiltration rates, and high evaporation, thus eventually favoring species that are more adapted to drier conditions. These communities have lost many of the attributes of a healthy rangeland, including good infiltration, minimal erosion and runoff, nutrient cycling and energy flow.

Kentucky and Canada bluegrass can be very difficult to eliminate once established. Practices such as seeding or brush management are not recommended mainly because of the potential for accelerated erosion when the soil surface is not protected by plant cover during an overflow event.

5a. Cover and structure (Historic Climax Plant Community)

COVER TYPE	BASAL COVER (%)	CANOPY COVER (%)	AVERAGE HEIGHT (inches)
Cryptogams	0–5	0–5	0.25
Grasses/ sedges	10–15	80–90	30
Forbs	1–4	1–5	12
Shrubs	1–5	1–10	18
Litter	40–60		
Coarse fragments	0–5		
Bare ground	5–5		

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5b. Major Plant Species Composition - Historical Climax Plant Community

Common Name	Plant Symbol	Plant Group	Percent Comp.	Group Max. %	Mean Annual Precipitation (inches)			
					11	12	13	14
					(lbs./acre)	(lbs./acre)	(lbs./acre)	(lbs./acre)
Grasses and Sedges 85–90%					2006-2125	2125-2250	2244-2375	2363-2500
Basin wildrye	LECI	2	20-40		470-945	500-1000	530-1055	555-1110
Nebraska sedge	CANE2	6	0-5		0-120	0-125	0-130	0-140
Prairie cordgrass	SPPE	14	0-10		0-235	0-250	0-265	0-2580
Western wheatgrass	PASM	14	5-15	15	120-355	125-375	130-395	140-415
Bluebunch wheatgrass	PSSP6	2	5-15		120-355	125-375	130-395	140-415
Green needlegrass	NAVI4	2	10-25		235-590	250-625	265-660	280-695
Bearded wheatgrass and Slender wheatgrass	ELTRS ELTRT	2	5-10	10	120-235	125-250	130-265	140-280
Needleandthread	HECOC8	10	0-10}	10	0-235 No more than 120 for any one	0-250 No more than 125 for any one	0-265 No more than 130 for any one	0-280 No more than 140 for any one
Sandberg bluegrass	POSE	12	0-5}					
Plains reedgrass	CAMO	16	0-5}					
Prairie junegrass	KOMA	12	0-5}					
Other perennial native grasses	2GP		0-5}					
Clustered field sedge	CAPR5	16	0-5}					
Baltic rush	JUBA	14	0-5}					
Other native sedges & rushes	2GLP		0-5}					
Forbs T–5%					T-120	T-125	T-130	T-140
American licorice	GLLE3	19	0-5}	5	0-120	0-125	0-130	0-140
Goldenpea	THMO	20	0-5}					
Goldenrod spp.	SOLID	19	0-5}					
Silverweed cinquefoil	POAN5	20	0-5}					
Cinquefoil spp.	POTEN	24	0-5}					
Aster spp.	ASTER	19	0-5}					
Horsemint	MOFI	24	0-5}					
Cudweed sagewort	ARLU	19	0-5}					
American vetch	VIAM	18	0-5}					
Western yarrow	ACMI2	19	0-5}					
Rocky Mountain iris	IRMI	20	0-5}					
Other perennial native forbs	2FP		0-5}					
Larkspur spp. *	DELPH	24	0-T}	T	0	0	0-T	0-T
Lupine spp. *	LUPIN	24	0-T}					
Death camas *	ZYGAD	32	0-T}					
Shrubs 5–10%					120-235	125-250	130-265	140-280
Western or Common Snowberry	SYOC/ SYAL	37	0-5}	10	120-235 No more than 120 for any one	125-250 No more than 125 for any one	130-265 No more than 130 for any one	140-280 No more than 140 for any one
Common chokecherry	PRVI	36	0-T}					
American plum	PRAM	37	0-5}					
Currant spp.	RIBES	37	0-T}					
Wood's Rose	ROWO	38	0-T}					
Silver sagebrush	ARCA13	36	0-5}					
Silver buffaloberry	SHAR	36	0-5}					
Other native shrubs	2SB		0-T}					
Total Annual Production (lbs./ac):			100%		2360	2500	2640	2780

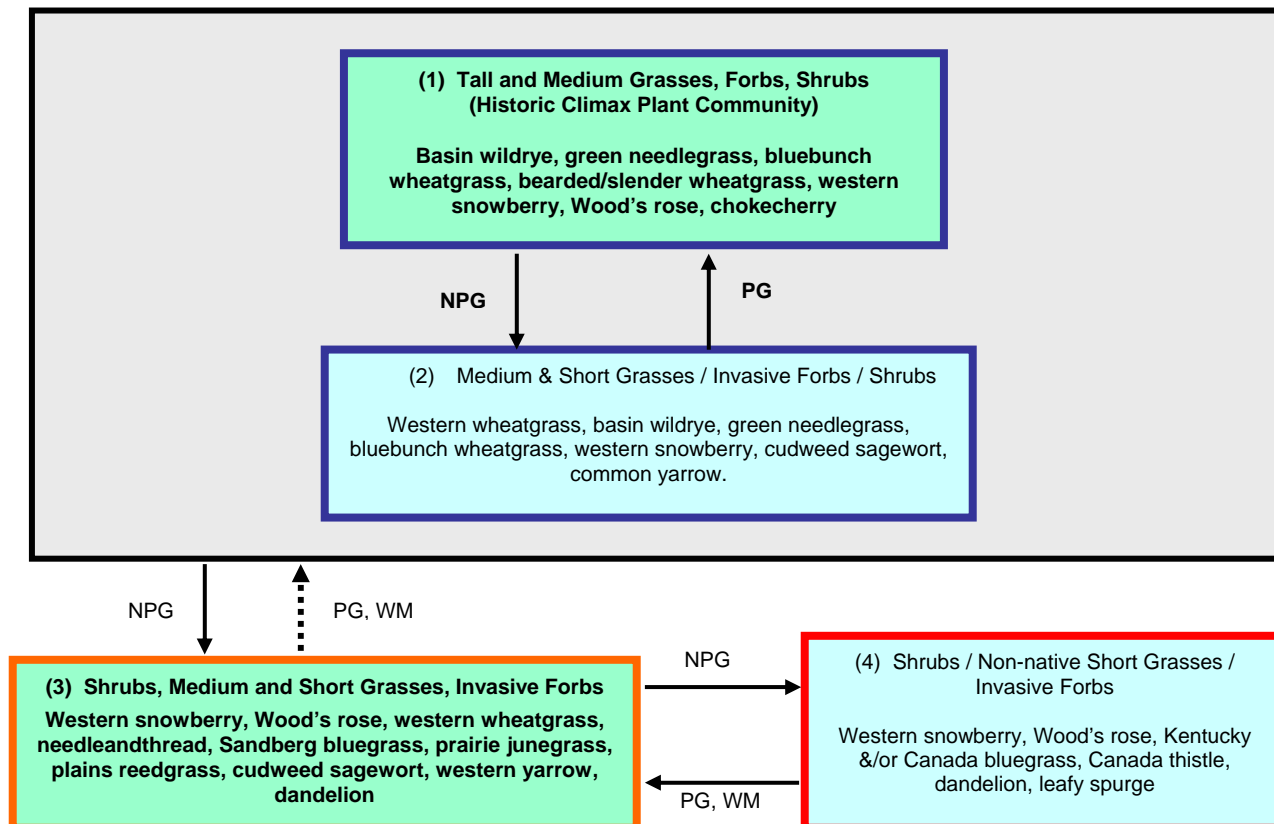
* These species are toxic to some grazing animals during at least some part of their life cycle.

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5c. Plant Communities and Transitional Pathways (diagram)



Smaller boxes within a larger box indicate that these communities will normally shift among themselves with slight variations in precipitation and other disturbances. Moving outside the larger box indicates the community has crossed a threshold (heavier line) and will require intensive treatment to return to Community 1 or 2. Dotted lines indicate a reduced probability for success. Yellow boxes indicate caution that the community may be in danger of crossing a threshold. Orange boxes represent communities that have crossed over thresholds from the HCPC and may be difficult to restore with grazing management alone. Red boxes represent communities that have severely shifted away from the HCPC and probably cannot be restored without mechanical inputs.

NOTE: Not all species present in the community are listed in this table. Species listed are representative of the plant functional groups that occur in the community.

PG = Prescribed Grazing: Use of a planned grazing strategy to balance animal forage demand with available forage resources. Timing, duration, and frequency of grazing are controlled and some type of grazing rotation is applied to allow for plant recovery following grazing.

NPG = Non-Prescribed Grazing: Grazing which has taken place that does not control the factors as listed above, or animal forage demand is higher than the available forage supply.

WM = Weed Management using either chemical, mechanical or specially-designed grazing systems. Caution must be used with chemical applications on this Overflow site.

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6. Livestock Grazing Interpretations: Managed livestock grazing is suitable on this site as it has the potential to produce an abundance of high quality forage. This is often a preferred site for grazing by livestock due to the succulent forage, and animals tend to congregate in these areas. In order to maintain the productivity of this site, stocking rates must be managed carefully on adjoining sites with less production to be sure livestock drift onto the Overflow site is not excessive. Management objectives should include maintenance or improvement of the plant community. Shorter grazing periods and adequate re-growth after grazing are recommended for plant maintenance and recovery. Heavy stocking and season-long use of this site can be detrimental and will alter the plant community composition and production over time.

Grazing this site early when the upper part of the soil may be wet can sometimes cause compaction. Hummocking (frost heaving) is often a common feature of this site. The hummocking can be exacerbated if grazing impact becomes excessive.

Whenever Plant Community 2 (medium and short grasses, invasive forbs, and shrubs) occurs, grazing management strategies need to be implemented to avoid further deterioration. This community is still stable, productive, and healthy provided it receives proper management. This community will respond fairly quickly to improved grazing management including increased growing season rest of key forage plants. Grazing management alone can usually move this community back to one more similar to potential since a good seed source of the taller grasses should still exist.

Plant Communities 3 and 4 have severely reduced forage production, and contain a high percentage of non-palatable species. Once this site is occupied by these communities, it will be significantly more difficult to restore it to a community that resembles the potential with grazing management alone. Western snowberry and/or Wood's rose often develop dense thickets that are stable and can be very difficult to remove or reduce.

The potential for using seeding and/or mechanical treatment to improve site health may be limited, due mainly because of the landscape position and potential for increased soil erosion from stream flow events.

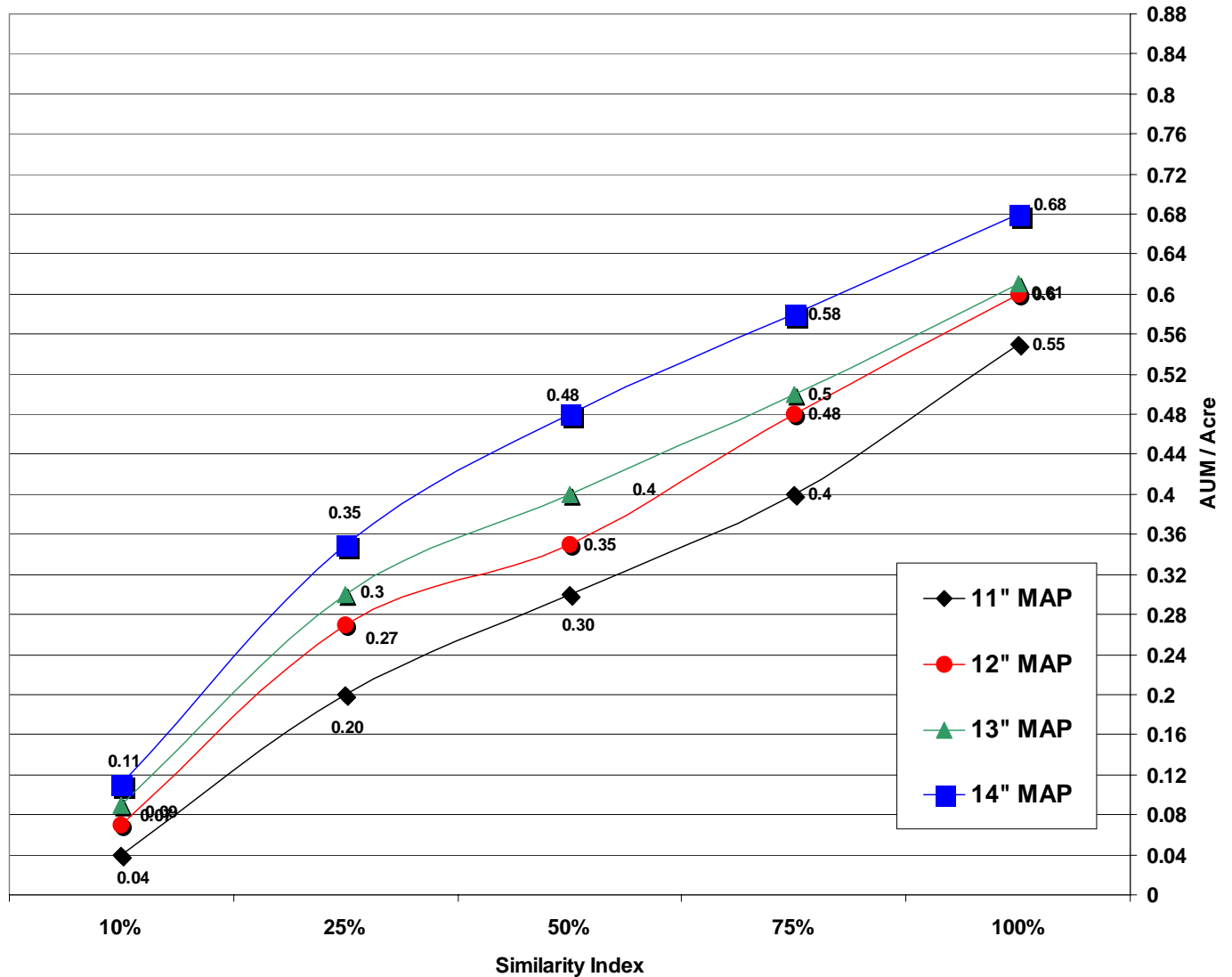
6a. Guide to Safe Stocking Rates: The following charts provide guidance for determining an initial safe stocking rate. Animal Unit Month (AUM) figures are based on averages of forage production from data collected for this site over several years. The characteristic plant communities and production values listed may not accurately reflect the productivity of a specific piece of land. These tables should not be used without on-site information collected to determine the average forage productivity of the site. Adjustments to stocking rates for each range unit must be made based on topography, slope, distance to livestock water, and other factors which effect livestock grazing behavior

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Stocking Rate Guide (Cattle) Overflow 11-14", 58AC



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6b. Stocking Rate Guide:

Major Plant Community Dominant Plant Species	MAP	Total Production (pounds/ac)	Cattle			Sheep		
			Forage Production	AUM/ac	Ac/AUM	Forage Production	AUM/ac	Ac/AUM
1. Tall and Medium Grasses, Forbs, Shrubs (HCPC) <i>Basin wildrye, green needlegrass, bluebunch wheatgrass, bearded/ slender wheatgrass, western snowberry, American vetch, chokecherry</i> (S.I. >75%)	13–14"	2640-2780	2250-2500+	.61-.68 +	1.5-1.6	2100-2350+	.57-.64 +	1.6-1.7
	11–12"	2360-2500	2000-2250+	.55-.61 +	1.6-1.8	1900-2125+	.52-.58 +	1.7-1.9
2. Medium & Short Grasses/ Invasive Forbs/ Shrubs <i>Western wheatgrass, basin wildrye, green needlegrass, bluebunch wheatgrass, western snowberry, cudweed sagewort, common yarrow</i> (S.I. 40–75%)	13–14"	1450-2365	875-2000	.24-.55	1.8-4.2	950-2125	.26-.58	1.7-3.9
	11–12"	1300-2125	775-1800	.21-.49	2.0-4.7	850-1900	.23-.52	1.9-4.3
3. Shrubs/ Medium & Short Grasses/ Invasive Forbs <i>Western snowberry, Wood's rose, western wheatgrass, needleandthread, cudweed sagewort, common yarrow, American licorice, dandelion</i> (S.I. 20–40%)	13–14"	925-1810	450-1075	.12-.29	3.4-8.1	500-1175	.14-.32	3.1-7.3
	11–12"	825-1625	425-975	.12-.27	3.8-8.6	450-1050	.12-.29	3.5-8.1
4. Shrubs/ Non-native Short Grasses/ Invasive Forbs <i>Western snowberry, Wood's rose, Kentucky/ Canada bluegrass, Canada thistle, dandelion, leafy spurge</i> (S.I. < 20%)	13–14"	470-1110	125-400	.03-.11	9.1-33.3	150-450	.04-.12	8.1-24.4

Stocking rates are calculated from average forage production values using a 25% Harvest Efficiency factor for preferred and desirable plants, and 10% Harvest Efficiency for less desirable species. AUM calculations are based on 915 pounds per animal unit month (AUM) for a 1,000-pound cow with calf up to 4 months. No adjustments have been made for site grazability factors, such as steep slopes, site inaccessibility, or distance to drinking water.

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7. Wildlife Interpretations: This ecological site is a “hotspot” of biodiversity as a result of extra moisture availability in ephemeral drainage ways. The run-in moisture provides more wildlife habitat complexity because of greater plant species and structural diversity compared to surrounding semi-arid uplands. The linear, meandering drainage pattern common to this site connects a wide variety of upland types and provides secure travel corridors for big game and many other wildlife species as they move between required seasonal habitats. Moisture availability and resulting habitat structural diversity provide for the food, cover and nesting needs of resident and transitory neotropical migratory birds. Invasive plant species are common on this site under non-use as well as season-long livestock and big game grazing. Canada thistle, leafy spurge, houndstongue and burdock are often found here. Prescribed grazing strategies can keep native vegetation more competitive with these invasive weeds. Wildlife habitat diversity is often degraded on this site under season-long grazing strategies because livestock are attracted to the green forage, particularly during the dry season. Seeps and springs common in association with this site provide drinking water for many wildlife species as well as habitat for less common invertebrates, reptiles and amphibians, birds and small mammals.

Plant Community 1: Tall and Medium Grasses/ Forbs/ Shrubs (HCPC): This moist site supports a variety of grasses and succulent forbs, which provide feeding substrate for numerous pollinating insects and other invertebrates. The insect food source, in combination with available moisture and habitat complexity, supports amphibians and reptiles such as Woodhouse’s toad and the common garter snake. Amphibians can be considered a “keystone species” because of their susceptibility to environmental degradation and resulting indicator value. The combination of tall and medium grasses, forbs and shrub patches provides high value nesting and escape cover for many breeding bird species. Gray catbirds, brown thrashers and spotted towhees rely on chokecherry, silver buffaloberry and rose/snowberry patches. Northern harriers hunt over, and nest within, low shrub and mesic grassland habitats. Sage grouse broods depend on invertebrate foods and succulent forbs available in overflow areas and associated springs and seeps. Sharp-tailed grouse use shrub patches for winter cover and feeding. Habitat complexity extra moisture provide habitat for a variety of small mammals including herbivorous meadow voles and seed-eating western harvest mice. The diversity of grasses, forbs and shrubs supports grazers and mixed feeders such as bison and elk as well as selective feeders such as mule deer and white-tailed deer.

Plant Community 2: Medium & Short Grasses/ Invasive Forbs/ Shrubs: Invertebrate abundance and species diversity declines with the reduction in desirable forbs, which reduces the attractiveness of this site to a variety of insectivorous wildlife species. Amphibian and reptile habitat value declines with the reduction in ground cover and invertebrate diversity. Breeding bird habitat value declines along with plant species diversity and ground cover. Sage grouse still find critical foods in the form of succulent forbs (i.e. dandelion and salsify), and insects. Cover value for small mammals and big game declines with the loss of taller grasses and forbs, although the potential increase in snowberry and rose compensates somewhat. An increase in invasive weeds often simplifies habitat structure even more.

Plant Community 3: Shrubs/ Medium & Short Grasses/ Invasive Forbs: Long-term continuous grazing simplifies the plant community significantly so the site provides fewer wildlife habitat niches as compared to Plant Communities 1 and 2, above. Insect populations are less diverse and productive. Ground level temperature rises and soil moisture levels decrease with loss of litter cover to the detriment of amphibian and reptile populations. Breeding and migratory birds find less cover and food resources; species favoring drier sites may increase although bird species diversity decreases significantly. Sage grouse broods still find some succulent forbs (dandelions, salsify) but sharp-tailed grouse winter habitat is all but eliminated. Small mammal diversity declines and big game species suffer loss of cover, food and travel corridor quality. Springs and seeps may partially dry up as less water is stored in the soil following loss of ground cover.

Plant Community 4: Shrubs/ Non-native Short Grasses/ Invasive Forbs: Wildlife habitat quality is very low in this greatly simplified community characterized by annual grasses, Kentucky bluegrass, dense patches of low shrubs and invasive weeds. Insect populations (grasshoppers) may be abundant in some years but no longer represent a reliable, diverse food resource for insectivorous wildlife. Amphibian habitat quality is very low as the site has dried out significantly. Reptiles are now represented by dry site tolerant species. Bird habitat is suitable for only a handful of species such as horned larks and longspurs. Big game find little cover and food in this potential travel corridor. Small mammal diversity is very low. Deer mice and pocket gophers may be fairly abundant.

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8. Hydrology Data: The soils associated with this ecological site are generally in Hydrologic Soil Group C. The infiltration rates for these soils will generally be moderate. The runoff potential for this site is low. Runoff curve numbers generally range from 64 to 89.

9. Site Documentation:

Authors: Original: NRCS, 1983 Revised: MJR, REL, RSN, POH, 2003

Supporting Data for Site Development:

NRCS–Production & Composition Record for Native Grazing Lands (Range-417): 3
BLM–Soil & Vegetation Inventory Method (SVIM) Data: 5
NRCS–Range Condition Record (ECS-2): 10
NRCS–Range/Soil Correlation Observations & Soil 232 notes: 15
Ecological Site Reference: NRCS 417 No.: Golden Valley County 501

Field Offices where this site occurs within the state:

Big Sandy	Columbus	Harlowton	Roundup
Big Timber	Crow Agency	Joliet	Stanford
Billings	Fort Belknap	Lewistown	White Sulphur Springs
Chinook	Hardin	Malta	Winnett

Site Approval: This site has been reviewed and approved for use:

Loretta J. Metz
State Rangeland Management Specialist

10/22/2004
Date

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Overflow, 11-14" MAP
Sedimentary Plains, Central
Plant Community 1
HCPC
Golden Valley County